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Improving Provider Adherence to Recommended Cervical Cytology Screening Guidelines

Amanda K. Worcester

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Improving Provider Adherence to Recommended Cervical Cytology Screening Guidelines

A Capstone Scholarly Project Presented By:

Amanda Worcester, DNP(c), BSN, RN

Doctor of Nursing Practice (DNP) Candidate

Family Nurse Practitioner (FNP) Track

University of Massachusetts Amherst

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Approved as to style and content by:

Chair, Jean E. DeMartinis, PhD, FNP-BC

Member, Karen Kalmakis, PhD, FNP-BC

Mentor, Mary E. Norato-Indeglia, MSN, MBA, ANP-C

Graduate Program Director
School of Nursing

Abstract

Cervical cancer is the second most common malignancy that affects women worldwide (WHO, 2011). Adherence to cervical cancer screening practice guidelines and use of high-quality screening practices by primary care providers (PCPs) can reduce associated rates of morbidity and mortality. With recent changes in practice guidelines stemming from evolving scientific evidence suggesting more frequent screening for cervical cancer leads to overtreatment, providers have not fully adopted newer, less frequent testing when indicated for otherwise healthy women. This research translation project involved the assessment of adherence to cervical cancer screening guidelines of 9 primary care providers (7 physicians and 2 nurse practitioners) employed at an urban outpatient internal medicine practice specializing in women's care. The 9 providers completed a pre-test of three clinical vignettes to assess baseline knowledge of current guidelines. Post-testing followed an educational intervention on the guidelines, resulting in 100% accuracy for all 9 providers. Participants identified patient understanding of newer guidelines as a barrier to lesser interval screening. Supplying providers with patient education resources creates the opportunity for patient-provider collaboration while enhancing patient-centered care.

Keywords: cervical cancer, cervical cancer screening, clinical practice guidelines, provider adherence, human papillomavirus, Papanicolaou smear

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Improving Provider Adherence to Recommended Cervical Cytology Screening Guidelines

Problem Identification

Cervical Cancer Screening Guidelines: Problem or Panacea?

Cervical cancer is the second most common malignancy that affects women worldwide (WHO, 2011). The National Cancer Institute (NCI) (2012) defines cervical cancer as malignancy arising from the tissues of the cervix, which is typically slow growing and asymptomatic in nature. This year alone, over 12,000 women in the United States will be diagnosed with invasive cervical cancer, with the majority being under the age of 55 (NCI, 2012). While cervical cancer was previously listed as one of the most common causes of cancer-related death of women in the United States before screening was instituted, it no longer reaches the top 10 (Saslow et al., 2012). When cervical cancer does occur, the majority of the time it is amongst women who have never been screened, or who have not been screened within the previous 5 years (Moyer, 2012; Saslow et al., 2012). The Papanicolaou (Pap) smear screening test for cervical cancer was introduced in the United States in 1941, and led to the first systematic effort to detect early cancer (Sirovich, Feldman, & Goodman, 2011). Since its introduction, Pap testing has been associated with a sustained reduction in cervical cancer incidence and mortality over many years.

The dramatic decline of cervical cancer over recent years is attributed to increased use of cervical cancer screening technologies, including the Pap smear as well as human papillomavirus (HPV) DNA tests. Thanks to such screening, the cervical cancer death rate in women declined by almost 70% between 1955 and 1992 (American Cancer Society [ACS], 2012) and now ranks 14th among cancer-related deaths in women. Secondary prevention through a screening regimen of cervical cytology with or without concomitant HPV DNA testing remains the best approach to protecting women from cervical cancer (American College of Obstetricians and Gynecologists,

[ACOG], 2010; Moyer, 2012; Saslow et al., 2012). Given these contemporary cervical cancer screening and diagnostic tools, as well as clinical practice guidelines for early detection, cervical cancer has become one of the most preventable forms of cancers affecting women (Sirovich, Feldman, & Goodman, 2011). Successful adherence to cervical cancer clinical practice guidelines and usage of appropriate high-quality screening and diagnostic tests by primary care providers (PCPs) can reduce rates of morbidity and mortality linked to cervical cancer.

Statement of Problem

When introduced too early or too frequently in a woman's life, increased and unnecessary cervical cancer diagnostic screening procedures, including the Pap and HPV tests, can be detrimental to her cervical and reproductive health, causing risk for cervical incompetence and miscarriage, as well as psychological stress from invasive medical procedures and excisional treatments. A critical review of evidence investigating the problem of increased Pap and HPV diagnostic testing leading to potential development of incompetent cervixes in women ages 15-65 secondary to overuse of cervical cytology screening procedures as evidenced by the lack of provider understanding and compliance with current clinical guidelines is essential to better understand factors regarding why primary care providers do not consistently follow current screening recommendations when assessing women for cervical abnormalities at the cellular level.

In recent years, clinical practice guidelines and recommendations have evolved based on scientific evidence that suggests more frequent testing for cervical cancer leads to overtreatment (ACOG, 2010; Moyer, 2012; Saslow et al., 2012). However, providers have not fully adopted newer, less frequent testing when indicated for otherwise healthy women. There is a crucial need to reaffirm these standards of care already employed by providers in everyday practice, which

have been shown to improve patient outcomes. Knowledge of and adherence to cervical cancer screening guidelines by primary care providers will help determine how best to disseminate and educate practitioners regarding its application. In an effort to better understand potential discord between clinical policy and current practice, the implementation of a research translation project may aid in further closing the gap between evidence regarding cervical cancer screening recommendations and current practice by primary care providers. Such a project may also provide meaningful evidence regarding the identification of specific changes that must be considered in order to increase adherence to recommended screening methods.

Evidence of Problem

Cervical cytology screening guidelines are created and frequently modified in order to help healthcare professionals appropriately screen women at risk. Current literature indicates that many primary care providers are not following guidelines on recommended screening intervals for cervical cancer with regards to the traditional Pap testing and DNA testing for HPV (Saraiya et al., 2010). As substantiated by much research, significant variation in cervical cancer screening among primary care providers has been noted (Holland-Barkis et al., 2006). The evidence based practice guidelines for cervical cancer screening are recommendations to all primary care providers employed in various settings and can aid in reducing unnecessary screening while improving screening for women at risk. Understanding the discord between clinical recommendations, policy, and practice can result in unnecessary testing costs and burden to women.

A Critical Review of the Literature

In preparation for the planning of this research translation project, a comprehensive evaluation of the literature for current cervical cytology screening recommendations and practice

guidelines, as well as problems with provider lack of understanding of and adherence to such guidelines, was performed utilizing the following databases: PubMed of the National Library of Medicine and the Cumulative Index of Nursing and Allied Health Literature (CINAHL). The following Medical Subject Headings (MeSH) terms were used to build a PubMed database search: cervical cancer, cervical neoplasm, human papillomavirus, Papanicolaou smear, and vaginal smear. Search terms for both databases included cancer, cervical cancer screening, cervical cancer treatment, Papanicolaou test, primary care, screening intervals, Pap testing, HPV screening, provider adherence, and guideline adoption. Inclusion criteria included full-text articles, English language only, cervical cancer screening in primary care setting, and women only (implied as inclusion criteria). Exclusion criteria included any studies focusing on guideline adherence for women requiring abnormal cervical cytology follow-up for high-grade precancerous cervical lesion or cervical cancer, as the focus of the review of literature was to be on preventive screening methods only. The literature provided valuable information pertaining to cervical cancer screening recommendations, risks associated with screening, the use of research evidence in practice, and barriers to guideline adoption.

An organized review of current peer-reviewed literature and evidence suggests that many primary care providers (PCPs) are not following clinical practice guidelines on recommended screening intervals for cervical cancer with regards to the traditional Pap and HPV testing (Holland-Barkis et al., 2006; Meissner et al., 2010; Roland et al., 2011; Saraiya et al., 2010). As sustained by much of this research, significant variation in cervical cancer screening among PCPs has also been noted, and recent investigations purport that providers may not be embracing recommendations for cervical cytology screening, as many continually screen at inappropriate intervals (Holland-Barkis et al., 2006; Meissner et al., 2010).

National Cervical Cancer Screening Guidelines

Differences may lead to screening practice problems.

There is supportive evidence that updates and recommendations to clinical practice guidelines for cervical cancer screening are relevant resources for clinicians, policy makers, and researchers alike with both interests and directives to promote the overall quality of cancer screening (Brouwers et al., 2011). Cervical cytology screening guidelines are created and frequently modified in order to aid PCPs in the appropriate screening of women at risk (Holland-Barkis et al., 2006). Standards of practice by all providers to women must be consistent so that no unnecessary procedures or harm befalls women receiving cervical cancer screening (ACOG, 2009).

Cervical cancer screening guidelines in the U.S. are issued by three highly regarded organizations: USPSTF, ACS, and ACOG. Guidelines issued by these groups since 2002 are specific with respect to starting age, stopping age, screening frequency, and groups for whom the standard recommendations do not apply. While guidelines are not identical across all professional organizations with published cervical cancer screening guidelines, ACOG, ACS, and USPSTF have developed guidelines for providers who care for women of all ages and all allow for intervals of cervical cancer screening at least 2 to 3 years after age 30 if the female has had 3 consecutive normal Pap tests (ACOG, 2009; Moyer, 2012; Saslow et al., 2012; Schwaiger, 2012). These guidelines are based on clinical trials presenting minimal differences in the cumulative reduction of cervical cancer in comparisons of one-, two- and three-year Pap test intervals and an understanding of the transient nature of most HPV infections (MacLaughlin et al., 2011).

As there is some overlap among the aforementioned three major guidelines, subtle

differences have led to confusion regarding screening practices to be employed by clinicians (Schwaiger, 2012). A U.S. survey of clinician's responses to screening vignettes, however, indicate that fewer than 25 percent would recommend screening consistent with the care agreed upon by all the guidelines, and choices representing overuse were most frequent (Yabroff et al., 2009). Much of the current literature reviewed surrounding provider understanding and use of cervical cancer guidelines is supportive of the fact that providers may not be adopting these recommendations for screening and are continuing to screen annually for cervical cancer, which may be contributing to over-screening and over-treatment of women who are not at high risk for developing cervical dysplasias (Holland-Barkis et al., 2006; Moscicki & Cox, 2010; Roland et al., 2011; Saraiya et al., 2011; Schwaiger, 2012).

Potential harms of screening for cervical cancer include, but are not limited to, anxiety of an abnormal test result, the risk of increased testing and costly invasive diagnostic procedures such as bleeding or infection, and risks of treatment including adverse pregnancy outcomes (ACOG, 2009; ACOG, 2010; MacLaughlin et al., 2011; Moyer, 2012; Saslow et al., 2012). To minimize such risks for unfavorable outcomes and potential hazard, recent revisions to screening guidelines have sought a balance to maximize the benefits of screening while minimizing the potential harms. Both the USPSTF and the ACS in combination with the American Society for Colposcopy and Cervical Pathology (ASCCP) and the American Society for Clinical Pathology (ASCP) released updated guidelines in early 2012 recommending screening for cervical cancer in women age 21 to 65 years with cytology (Pap smear) every 3 years or, for women age 30 to 65 years who want to lengthen the screening interval, screening with a combination of cytology and HPV testing every 5 years (Moyer, 2012; Saslow et al., 2012). These recommendations are

made without regards to sexual history of the female being screened (Moyer, 2012; Saslow et al., 2012).

According to ACOG, whose most recent cervical screening clinical practice guidelines were last revised in 2009, the endorsement to begin cervical cytology screening at age 21, regardless of age of onset of sexual intercourse, is based in part on the limited incidence of cancer among young women, and as well as the risk of possible adverse effects or experiences endured during the course of follow-up for these young women with abnormal findings from cytology screening (ACOG, 2009). Previously, ACOG's recommendations had proposed that providers caring for women in the primary care setting should begin cervical cancer screening three years after first sexual intercourse or by age 21, whichever occurred first. In order to avoid economic, emotional, and future implications of unnecessary treatment of adolescents, ACOG's guideline suggests that there be transition from baseline cervical cancer screening to age 21, unless otherwise implicated by potential risk factors (ACOG, 2009; ACOG, 2010; Moscicki & Cox, 2010). Like ACOG's latest screening recommendations, the USPSTF and ACS also recommend against screening for cervical cancer in women younger than age 21 years. USPSTF, ACS, and ACOG all base their endorsements and recommendations on high quality, consistent scientific evidence (Level A recommendations) (ACOG, 2009; Moyer, 2012; Sirovich, Feldman, & Goodman, 2011; Saslow et al., 2012; Schwaiger, 2012).

There is considerable supportive evidence that updates and recommendations to clinical practice guidelines for cervical cancer screening are relevant resources for clinicians, policy makers, and researchers alike with both interests and directives to promote the overall quality of cancer screening (Brouwers et al., 2011). Cervical cytology screening guidelines are created and frequently modified in order to aid PCPs in the appropriate screening of women at risk (Holland-

Barkis et al., 2006). Standards of practice by all providers to women must be consistent so that no unnecessary harm befalls women receiving cervical cancer screening (ACOG, 2009).

Use of the Research Evidence in Practice

Data suggestive of poor adherence to the ACOG, USPSTF, and other cervical screening guidelines are common (Holland-Barkis et al., 2006; Moscicki & Cox, 2010; Roland et al., 2011; Saraiya et al., 2011). As supported by Roland et al. (2011), who assessed HPV test practices and Pap test screening interval practices of U.S. PCPs, there is a clear need to document the implementation of screening methods and guideline adherence by providers, given the ever changing advancements in the health care fields, increasing new technologies, and emerging practice guidelines. The USPSTF has long recommended extending cervical cytology screening (by means of Pap testing) intervals up to every three years (ACOG, 2009; Whitlock et al., 2011).

A systematic review by Whitlock et al. (2011) for the USPSTF revealed evidence supporting the use of liquid-based vs. conventional cytology screening of cervical cancer. Whitlock et al. (2011) suggest there is need for more complete evidence before enhanced HPV testing as a means of primary screening is widely adopted, while some key details remain ambiguous, including how early detection may be improved, whether such an approach would have a positive effect on detection of invasive cervical cancer, and if potential burden and harm suffered would ensue. Such findings highlight the significance of the need for PCPs to understand appropriate methods and intervals of cervical cancer screening.

In 2011, 1,212 PCPs were surveyed about their cervical screening practices. The data revealed that 950 of the total PCPs surveyed performed Pap tests and recommended the HPV test for patients (Saraiya et al., 2011). Participants in the study reported their screening recommendations in response to clinical vignettes. Other investigations have studied the

adoption of cervical cancer screening recommendations by PCPs through cross sectional analysis with multi-stage probability samples, where the main outcome measure included self-reported data using clinical vignettes (Holland-Barkis et al., 2006; Meissner et al., 2010; Roland et al., 2011). Although these studies used large, national population-based samples, yielding high response rates, limitations of such investigation may include response bias, and the fact that survey response answers may not reflect other factors that may influence practice (Holland-Barkis et al., 2006; Saraiya et al., 2011).

The use of clinical vignettes was a notable trend when reviewing the evidence on PCPs' practice of cervical cancer screening (Holland-Barkis et al., 2006; Meissner et al., 2010; Roland et al., 2011; Saraiya et al., 2011) and is regarded as a reliable tool for PCPs' self-report of practice (Saraiya et al., 2011). Clinical vignettes are used to describe clinical conditions to illustrate unique and important teaching points. As suggested by Veloski et al. (2005), clinical vignettes provide insight into clinical practice, education, or research in both outpatient and hospital settings. Veloski et al. (2005) also propose that open-ended clinical vignettes are evidenced based, valid, and cost-effective tools to use when evaluating primary care providers' quality of care and practice variation in an outpatient setting, especially when compared to standardized patients and chart abstraction. The clinical vignette, when used in conjunction with additional education strategies, is a potentially efficacious solution to improve the lack of provider adherence to and understanding of newer cervical cancer screening guidelines by reaffirming and reeducating providers' knowledge of such updated practice recommendations.

Barriers to Guideline Adoption

This critical review of evidence surrounding current cervical cancer screening practices has largely shown that while the clinical practice guidelines for cervical cancer screening are

well written, revised, and supported by research, they are often not being used correctly by providers. There also exists some confusion surrounding newer guidelines. Numerous barriers, along with possible solutions to such barriers, which may potentially influence the adoption of appropriate cervical cancer screening practices, are proposed in current literature, but warrant further investigation and study (Holland-Barkis et al., 2006; Meissner et al., 2010; Moscicki & Cox, 2010; MacLaughlin et al., 2011, Saraiya et al., 2011).

Varied adherence to published guidelines may be due to limited awareness, familiarity, agreement, self-efficacy, or outcome expectancy (Holland-Barkis et al., 2006), as well as other factors associated with less frequent screening by PCPs, such as the USPSTF possessing great influence over clinical practice (Meissner et al., 2010). Moscicki & Cox (2010) offer that other possible confines may include government legislation, loss of pretext for health screening, along with time constraints present in primary care. A wide variation of adherence to guidelines may also be due to significant intra-specialty differences regarding adherence to the providers' own specialty's guidelines (Holland-Barkis et al., 2006; Meissner et al., 2010; Saraiya et al., 2011). MacLaughlin et al. (2011) identified women's belief about cervical cancer testing frequency as the strongest predictor of attitude toward less frequent screening. They suggest that future research should explore why some patients continue to expect annual testing and identify interventions to help providers elicit and reform patients' expectations about cervical cancer screening.

Review and analysis of high-quality evidence is crucial to evidence based practice, and the identification of solutions to defined problems within evidence-based practice is just as critical. Brouwers et al. (2011) systematically retrieved best evidence available to find which interventions have been shown to increase the uptake of cervical cancer screening. After a

systematic review of 66 studies, investigators concluded that reduced structural barriers, and supplying PCPs with both evaluation and feedback were suggested interventions to improve screening practices (Brouwers et al., 2011). Research shows that these interventions to increase adoption of cervical cancer screening will need to take place at multiple stages in order to increase adherence by PCPs, such as the utilization of informed decision-making interventions, which may reduce unwarranted testing, as well as the suspension of insurance coverage for annual Pap tests when they are not appropriately indicated (Briss et al., 2004; Meissner et al., 2010). Regardless, policy makers should be cognizant of implementation costs associated with newer technology, training, and reimbursement in determining the best approaches for promoting practices that are supported by the latest scientific evidence as included in practice guidelines (Meissner et al., 2010).

Theoretical Foundation: Knowledge-To-Action Model

The knowledge-to-action (KTA) cycle, or model, is a comprehensive framework that incorporates the full cycle of knowledge translation from knowledge creation through implementation and impact (Graham et al., 2006). Integration of knowledge creation and knowledge application represents the theoretical foundation to support the implementation of a program to increase adoption of cervical cancer screening by primary care providers. Graham et al. (2006) proposed the KTA conceptual framework (Figure 1) as a valuable tool for facilitating the use of evidence based knowledge to identify gaps from knowledge to practice (White & Dudley-Brown, 2012).

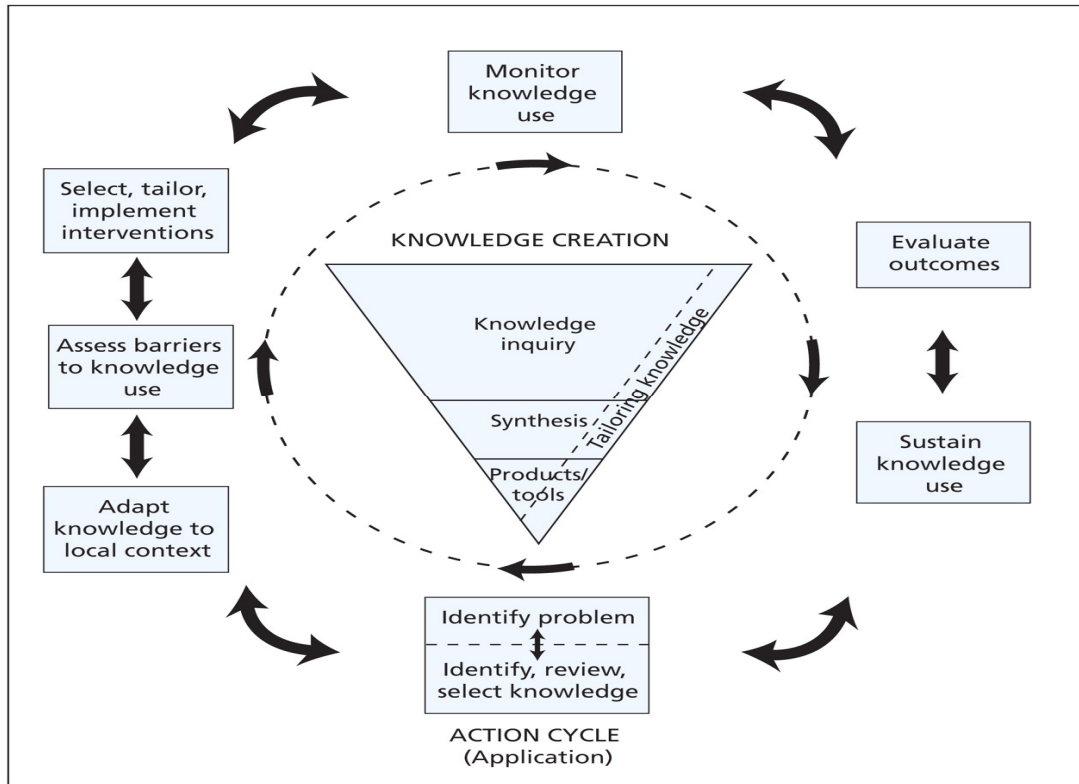


Figure 1. *The Knowledge-to-Action Cycle*. Adapted by Harrison, M., Légaré, F., Graham, I., & Fervers, B. (2010) from “Lost in knowledge translation: Time for a map?” by I. Graham, J. Logan, M. B. Harrison, S. Straus, J. Tetroe, W. Caswell, & N. Robinson (2006), *The Journal of Continuing Education in the Health Professions*, 26, p. 19.

The KTA framework is comprised of two main components: a knowledge creation funnel and an application of knowledge cycle. Knowledge creation consists of three phases: knowledge inquiry, knowledge synthesis, and knowledge tools/products. The action cycle represents the activities needed for knowledge application. Graham et al. (2006) conceptualized the KTA cycle to be both complex and dynamic, as the phases of the action component may occur sequentially or simultaneously, and the knowledge creation component phases may also influence the action phases. During the KTA cycle, it is also necessary to evaluate the impact of using the knowledge to determine if use has impact on desired outcomes for patients, practitioners, or the system.

The KTA framework emphasizes collaboration between knowledge producers and knowledge consumers (White & Dudley-Brown, 2012). The integrated KTA framework supports

the need to develop and apply best evidence for clinical practice, particularly those related to uptake and integration of appropriate cervical cytology screening methods and intervals. This is enhanced when all parts of the process consider the evidence and means to facilitate its implementation in practice, and when collaboration occurs among researcher, clinician, and when possible, patient.

The KTA model provided a theoretical basis for identifying methods to improve provider adherence to cervical cytology screening guidelines through assessing barriers to knowledge utility, as well as through selecting, tailoring, and implementing educational interventions. Clinical vignettes were selected and used as a means to assess and re-assess provider understanding of current cervical cancer screening guidelines with the implementation of a programmatic educational intervention (pre/post-test design with review of educational handout on current practice guidelines). Use of the KTA cycle and framework is directed towards the outer action, or application, cycle.

Organizational Analysis

Group Description

The clinical practice setting selected for the implementation of this research translation project was chosen given ease of access, locale, overall availability, and potential benefits for providers in practice, which in turn also benefits the adult female patient as the health care consumer. The project was implemented at in an outpatient, internal medicine primary care setting specializing in women's health care, where providers offer comprehensive health care and routine gynecology services to young adult, middle-aged, older-aged, and elderly women living in the Greater Boston, Massachusetts area, receiving preventive health care, including cervical cytology screening (i.e., Pap smears, HPV screening).

The chosen practice organization is affiliated with Massachusetts General Hospital, a nationally ranked primary teaching hospital of Harvard Medical School and a biomedical research facility located in Boston, Massachusetts. The practice is located in a ten-floor outpatient care facility, one of the largest and most comprehensive outpatient buildings in New England. The specific women's health practice serves a diverse population of female clients from age 18 throughout older adulthood. Demographic characteristics of the female population served by providers in this specific practice setting vary among age, race, ethnicity, and socioeconomic background, but includes clients from Boston (inner city), and many of its suburban regions, including those located on both the Northern and Southern shores of Massachusetts.

The providers serving this select population of women include 15 board-certified, licensed physicians (MDs) and 2 nurse practitioners (masters prepared NPs) with specialty training and credentialing in family practice, general medicine, internal medicine, and women's health care. The sample attained for this project included all licensed primary care providers (MDs and NPs) accountable to current cervical cancer screening guidelines (i.e., those published by ACOG and USPSTF), who were employed at the clinic described above at the time of project implementation, inclusively. Exclusion criteria included staff not licensed or certified to perform cervical cancer screening under their professional scope of practice (i.e. office or nursing staff, medical assistants). The sample of participants was a convenience (nonrandom) sample of 9 primary care providers (7 MDs and 2 NPs) out of the practice's 17 employed providers. This sample type was chosen given the nature of the project's scope and accessibility to providers.

As was noted during the preliminary stages of this project's development during prerequisite studies of the DNP(c), it was a shared belief of many practice providers that current cervical cancer screening guidelines for women are ever-changing and many felt it difficult to

stay abreast of new information and modifications of such guidelines. Most providers acknowledged that they were familiar with the current guidelines but frequently needed to refer back to the guidelines to be sure they were staying current with screening recommendations. Prior to project implementation, providers at the practice agreed that this project could help to improve performance and positively influence office visits with female clients requiring appropriate cervical cancer screening, while remaining relatively cost and time neutral for the entire practice. It was the hope of the providers, this DNP(c), and the practice manager that the improved screening practices and performance of providers would become part of the overall provision of care and comprehensive services delivered to women in applicable age groups at this primary care internal medicine practice.

Engaging Key Stakeholders

The purpose of this performance improvement project was to evaluate the knowledge and awareness of primary care cervical cytology screening guidelines among a primary care practice that employs multi-disciplinary providers, including 15 physicians as well as 2 nurse practitioners. Effectively engaging these individuals as key stakeholders was vital for the success of this project, as well as the completion of a needs assessment to determine the presence of gaps in practice relative to this project's defined population and the specified health problem (see Key Stakeholders agreement letter in Appendix A). The key stakeholders were all of the providers employed at the practice, as well as the female patients who receive cervical cancer screening pursuant to current clinical practice guidelines. The 17 providers' participation in this project was a core measure in the success or failure of this research translation project that emphasizes performance improvement. A total of 9 out the 17 employed providers agreed to be a part of this

project and those who participated understood the importance of the project outcomes as they relate to potential performance improvements.

Resources, Facilitators, and Barriers

Given that the type and amount of resources required for the implementation of a needs-based health program may vary with the interventions used, the expertise of the personnel and facilitators, characteristics of the targeted audience, and the acquisition and management of resources all affect the success of a program (Issel, 2004). Organizational planning for this performance improvement project included: informational resources (computer hardware and software), monetary resources (budget as provided by this DNP(c)), physical resources (project materials, facilities, and equipment), managerial resources (project facilitator), and time resources (planned timeline and provider availability). Such organizational plan objectives aided in directing and determining critical aspects and components of implementing this research translation project. The project facilitator was the author of this research translation project, a DNP candidate enrolled at the University of Massachusetts Amherst, School of Nursing.

During planning phases for this research translation project, verbal and written agreements were made among the practice manager, several practice providers (including the DNP(c)'s clinical preceptor/mentor), and the DNP(c) to use practice resources available, including the practice's conference room for full access to providers at a weekly meeting typically conducted during regular business hours. However, given unforeseen circumstances involving changes to provider scheduling and availability of practice's conference room, the implementation strategy of the project was modified from using a group method to approaching each provider individually regarding their willingness to participate in the project. Finances were

limited, but were relatively low for the DNP(c) who served as the main source of finances for this project's implementation. Further cost analysis is outlined later in this report.

Potential barriers and constraints to the project implementation included: time required to reeducate the providers on recent changes and updates to cervical cancer screening guidelines, time constraints given providers busy patient schedules, varying provider schedules, provider resistance to change (including differences in culture, beliefs, and perceived ability to apply the screening recommendations, especially among patients who may also be resistant to receiving cervical cancer screening at lesser intervals). While it was an anticipated barrier on the part of the DNP(c) in project planning phases, providers' lack of awareness or knowledge of changes to current cervical cancer screening guidelines was not a barrier to project implementation. The current recommendations and guidelines for cervical cancer screening in women ages 21-64 was summarized in chart form and distributed to all providers, so that they could easily reference screening recommendations despite potentially demanding patient schedules (Appendix B).

Although the pre-post test design planned for this implementation project offered several advantages (i.e., ease of administration, efficient, minimally disruptive to providers' clinical responsibilities), its limitations should also be acknowledged. Such limitations or barriers to implementation involving standard pre-post design is that this project design afforded only two data points per provider, and also lacked the use of a control group. These limitations were therefore considered within the context of this project's outcomes and overall utility.

Protocol and Plan

A program evaluation design was chosen for this research translation project. A total 17 primary care providers were approached about participation in the project, and 9 providers (7 MDs and 2 NPs) from the women's health outpatient internal medicine practice established in

Boston, Massachusetts were successfully recruited and agreed to participate in the project. All of the providers were certified and trained in the comprehensive health care of the adult female client. Clinical vignette-based surveys (included below in Table 1) were used as a part of a programmatic educational intervention in order to examine provider report of recommendations for next interval cervical cancer screening of a hypothetical 35 year-old female patient receiving care in the primary care setting. For the purpose of this project, a clinical vignette-based pre-test survey of provider knowledge was administered (Table 1), followed by a 10 to 15 minute discussion between the participant and the DNP(c) regarding the review of a printed educational handout referencing the current best practice of cervical cytology screening according to nationally recommended clinical practice guidelines (Appendix B). This review and discussion was then followed by a subsequent post-test (Appendix C).

Table 1. Clinical Vignette-Based Survey Questions

Clinical Vignette 1
<i>A 35 year-old female patient presents to your primary care office for a comprehensive physical exam. Her 3 most recent annual Pap test results have been normal and she denies any new sexual partners during the past 5 years. What cervical cytology screening, if any, would you recommend at this visit?</i>
Clinical Vignette 2
<i>A 35 year-old female patient presents to your primary care office for a comprehensive physical exam. Within the past 5 years, she has had 1 normal Pap test result and denies any new sexual partners. What cervical cytology screening, if any, would you recommend at this visit?</i>
Clinical Vignette 3
<i>A 35 year-old female patient presents to your primary care office for a comprehensive physical exam. She has a negative HPV test result and a normal Pap test result from this year. What cervical cytology screening, if any, would you recommend at this visit?</i>

The educational handout reviewed with project participants is a duplicate of the 2012 USPSTF clinical summary of the most current cervical cancer screening recommendations. It is important to note that revision to the handout was not necessary from the planning stages of the research translation project to project actualization, as current cervical cancer screening

guidelines were not updated during the elapsed time between project design and implementation. It should also be noted that as this performance improvement project launched, appropriate and applicable adjustments to its plan were made where and when appropriate, dependent upon the manner in which the research translation project unfolded.

Project Implementation

Methods

A total of 9 primary care providers were recruited for this performance improvement project, and upon their individual agreement of participation in the project, all were assessed, educated, and then re-assessed on their knowledge and awareness of current cervical cancer screening guidelines used within primary care. Participation was strictly voluntary and arrangements for formal meeting times were made between each participant and the DNP(c) prior to the project's initiation. This was a modification from the initial project proposal, with the aim of engaging the most participants as possible via one-on-one meetings versus a singular one-time group meeting within the practice setting. Agreements and planned commitments for one-on-one meeting times with the DNP(c) and the participating provider were arranged at times so not to interfere with patient visits and other provider responsibilities. All providers were asked to consider participation on the project, and those who were agreeable were given the pre-test clinical vignette-based survey to complete independently within five to ten minutes, and were then asked to return the pre-test to the project investigator.

The clinical vignette-based survey tool used during both pre- and post-testing was the sole data collection tool. Basic descriptive statistics were used to evaluate the results of the clinical vignette-based surveys completed during program implementation. The program intervention of providing clinician education by means of an educational tool occurred between

pre- and post-testing of this one group. This research project design focused on the pre-testing of a single group, followed by the exposure to an intervention (educational program), and culminated with post-testing following the intervention. The overall success of the project was determined by comparing pre-test and post-test data to determine if provider exposure to education pertaining to most current cervical cancer screening clinical practice guidelines impacted adherence to the guidelines in practice.

Additionally, qualitative data regarding provider's perceived understanding of and adherence to current guidelines, as well as barriers to successful implementation of recommended screening practices, was collected during one-on-one meetings between the DNP(c) and the project participants. This aided the DNP(c) in making logical inferences from project results, while also helping to identify obstacles to project sustainability. Content analysis including the generation of inferences from communication during one-on-one meetings with participants was also used to outline common factors essential to effective cervical cancer screening guideline use in primary care practice.

Those who agreed to participate then received a brief educational review of current clinical practice guideline recommendations (approximately 10 to 15 minutes) pertaining to cervical cancer screening among women ages 21-64 within the primary care setting (Appendix B). Following the educational programmatic intervention, participants were then asked to complete the post-test (an identical clinical vignette-based survey, see Table 1) to assess for awareness of the clinical guidelines following the educational intervention. Participants had then successfully fulfilled the requirements of the first phase of this project's initially planned implementation, and were then asked to consider and apply the education provided pertaining to

cervical cancer screening as they deliver comprehensive and preventive health care to their female clients ages 21-64.

The initial proposed plan for this implementation project included a second phase where the original group of project participants would receive a repeat post-test approximately one month after initial evaluation using the same clinical vignette-based survey from the initial phase of the project. However, given the overwhelming correct response rate to pre- and post-test clinical vignette-based surveys by all participants, the project plan was modified to omit this additional phase. In order to efficiently manage the project's data, the pre-test version of the tool was printed on a different colored paper (yellow) than the post-test version of the tool (lavender) to easily differentiate between the pre- and post-test and to ensure that the data remained distinctly separate. Data was subsequently entered into a Microsoft Excel spreadsheet for data management and analysis.

Goals

As defined by Issel (2004), goals are broad statements regarding the outcomes to be achieved with the implementation of a specific health program. The overall encompassing goals of this performance improvement project were to effectively inform and educate primary care providers at a women's health outpatient internal medicine practice on the most current cervical cancer screening guidelines, and to provide further education and support which would equip the providers with quick reference and access to summary recommendations of the current cervical cytology screening guidelines in order to increase the direct application of these current practice recommendations. This DNP(c) as the principal investigator of this impact evaluation design project aimed to accomplish these goals by first assessing provider awareness and knowledge of cervical cytology screening recommendations, followed by providing the in-person educational

programmatic intervention aimed at increasing awareness to current guideline standards through the use of an educational handout, and then conclude with re-assessing provider knowledge via self-reported responses to correct methods of interval cervical cytology screening based on clinical vignette-based surveys (post-test analysis).

Objectives

Performance improvement programs require goals and expected outcomes that drive the project, including the evaluation of the impact of the project, as well as data collection and analysis. Quality effect objectives refer to the program participants and the benefits they will experience as a result of receiving the program interventions (Issel, 2004). Objectives are specific statements regarding the potential impact of a health program's implementation, stated in measurable terms. Specifically, clearly stated effect objectives will guide the evaluation of a program by providing reference to a time frame, the program participants to be affected, a health outcome related to the program interventions, and a quantifiable target value for that health outcome (Issel, 2004).

There were three objectives of this impact evaluation project. First, recruit an adequate sample of providers agreeable to participation in the performance improvement project who have a present need for and baseline understanding of cervical cancer screening recommendations in women ages 21-64. Second, educating and re-affirming current clinical guidelines pertaining to cervical cancer screening in primary care through an educational programmatic intervention would ultimately aid providers in more effectively managing screening practices of this given population of patient clientele while altogether minimizing harm related to over or under screening. The final objective was the successful application of cervical cancer screening guideline recommendations following the performance improvement project's implementation,

which directly impacts clients in a positive manner in regards to their comprehensive and preventive health care outcomes. However, this final objective was modified after initial project implementation given the initial positive responses by participating providers on the first pre- and post-test. The impact of the education program intervention was not subsequently evaluated through post-testing using the clinical vignette-based survey one month after the program's initial implementation, given that all participants' response rate was mastery at baseline.

Outcome Expectations

The measurable outcome expectations for this project were as follows: of the available practice providers, 75% would be successfully recruited and agree to participate in this performance improvement project through completion (13 out of 17 providers); 60% of sampled providers who screen women ages 21-64 routinely for cervical cancer would demonstrate increased knowledge pertaining to current best practices of cervical cancer screening, and responses to clinical vignette-based surveys as well as one-on-one interviews would show that at least 60% of sampled providers would find the use of the educational programmatic intervention supplied during the program helpful in the direct care of their patients, essentially decreasing the chance for poor outcomes or potential adverse harms related to inappropriate cervical cancer screening practices.

In order to document changes across pre- and post-test conditions, accuracy scores for each provider-completed clinical vignette-based survey were obtained. The same patient-focused vignettes were used as a pre- and post-test during the implementation of the program, though participants did not receive any feedback during the pre-testing phase until they completed a post-test. Expected outcome measurement helped to set parameters for impact analysis and included the evaluation of reported open-ended recommendations for the timing of screening

intervals for the hypothetical 35 year-old female patients using the three different vignettes. In each clinical vignette, screening was to be performed by a licensed and certified primary care provider.

Budget: Cost and Benefit Analysis

Budgets are a means for planning and tools for communicating priorities need for a health program. By projecting dollar and time costs in advance of project implementation, the DNP(c) was able to assess fiscal feasibility of the planned impact evaluation project (Issel, 2004). The development of a budget with cost/benefit analysis in terms of costs in time and revenue to a practice setting, as well as potential benefits to clients and providers, helped to highlight the programmatic necessities warranted to be fiscally responsible and efficient. As the project investigator, the DNP(c) contributed all of the funds necessary to implement this project at all stages. The financial budget for the project was low, as the total cost came to \$92.00, as outlined in Table 2.

Table 2. Cost Itemization

Item	Cost
<i>Physical Materials</i>	
1 ream of multi-colored printer paper	\$10.00
1- 18 pc pack of standard ballpoint pens	\$5.00
Copying/printing of project handouts/questionnaires	\$17.00
<i>Computer Information Systems</i>	
Laptop equipped with Microsoft Excel software (not needed for purchasing for project)	\$1,000.00 [not included in total cost of project; owned by DNP(c)]
<i>Personnel</i>	
DNP candidate as project investigator	3 credits (\$750 per credit)= \$2, 250.00 [not included in total cost given educational benefits of project incurred by DNP(c)]
<i>Transportation/Travel</i>	
Travel/commuting expenses to/from practice setting (MBTA public transportation/parking)	\$20.00 round trip fare cost x 3 trips= \$60.00
<i>Project Space for Program Implementation</i>	
Meetings spaces (located within practice setting)	No cost (available free of charge within practice setting, i.e. provider offices/exam rooms)

<i>Total Cost/Expenses</i>	
Total Estimated Cost	\$3,342.00
Total Estimated Cost for Project (minus costs of services volunteered)	- \$3,250.00
Total Actual Costs	\$92.00 (final cost of project implementation)

Actual costs, as funded by the student investigator, included physical materials (i.e., colored paper, pens, printing of educational handouts/photocopies- ~\$32.00) and gas/commuting expenses (i.e., transportation to/from practice setting at scheduled times- ~\$60.00). Student time in conjunction with planned course work hours were used to analyze and evaluate outcome data and disseminate results by the DNP(c), who absorbed the cost of designing the educational handouts, educating the providers through the planned programmatic intervention, implementing the project in its entirety, and analyzing the results.

There was no expected loss of revenue through blocked-off patient office visits, as the program took place during pre-established one-on-one meeting times committed to by each participant and the DNP(c) outside of patient visit hours (i.e. lunch breaks). Thus, it was the belief of the DNP(c) that the cost in time was generally low, revenue generated by patient office visits remained unaffected, and providers and patients alike benefited from the expected outcome of enhanced provider knowledge of cervical cancer screening guidelines at the completion of this impact evaluation project. As the project participants, providers and patients at the designated practice setting benefited from the educational and performance improvement opportunities rooted within the project, which has a direct impact on the standard care of patients seen by MDs and NPs at the practice. Therefore, it was the belief of the DNP(c) that benefits largely outweighed any time potential costs or overhead donated by the practice setting and participating providers.

Protection of Human Subjects

This project involved the utilization of a clinical vignette-based surveys as well as programmatic educational interventions to assess provider understanding of current cervical cancer screening guidelines and to help close this knowledge-to-practice gap relating to standards of care. The provider, rather than the patient, was the human subject. Given the program evaluation design of this project, as well as the reduced risks posed to its participating subjects, it was exempt from Institutional Review Board (IRB) requirements of both the practice's organizational IRB protocols and the University of Massachusetts Amherst where the DNP(c) is enrolled.

There were no identifiable or discernible risks to the project participants, nor was there a need to identify any participants' identity (i.e., the study did not collect personal data that is identifiable other than pairing pre- and post-tests with a non-identifying numeric code to allow for participant pre-post comparisons). Confidentiality was maintained at all stages of the research translation project and providers completing the clinical vignette-based surveys were asked to not write their name on their completed surveys. The protection of data collected was maintained through storing data in a locked storage area within the DNP(c)'s personal home office. As it was not applicable to this project's implementation, no actual patient data was reviewed or obtained from medical records; therefore there was no breach in policies surrounding the Health Insurance Portability and Accountability Act (HIPPA).

Timeline of Project Actualization

In order to stay on course for timely completion of this performance improvement research translation project, an initial timeline was developed by the DNP(c) in pre-planning stages as a representation of specific dates, time spans, and sequence of events in planning, initiating,

sustaining, and evaluating this health program. The projected timeline and actions to complete are outlined in Table 3.

Table 3. Timeline of Actions

Timeline	Action
September 2012 – November 2012	<ul style="list-style-type: none"> • Capstone project proposal formulated (beginning phases) • Materials prepared (i.e., vignettes, educational handout)—both pre- and post-tests
December 2012 – January 2013	<ul style="list-style-type: none"> • Identified the clinical setting • Verified exemption of IRB (at both practice site and University of Massachusetts Amherst) • Capstone project proposal accepted
January 2013	<ul style="list-style-type: none"> • Contracted the clinical setting, described and disseminated project plans, while identifying key stakeholders within practice setting
January 2013 – February 2013	<ul style="list-style-type: none"> • Met with clinic management, practice manager, and project mentor to provide in-depth review of project plans
March 6, 2013 March 7, 2013 March 7, 2013	<ul style="list-style-type: none"> • Initiated impact program <ul style="list-style-type: none"> ▪ Pre-testing ▪ Educational intervention supplied to participating providers ▪ Post-testing ▪ Debriefing during one-on-one meetings with participating providers (journaling of qualitative results) ▪ Data collection completed
March 2013 – April 2013	<ul style="list-style-type: none"> • In depth data analysis following project implementation to assess provider knowledge and awareness of cervical cytology screening
Late April 2013 – May 2013	<ul style="list-style-type: none"> • Written research translation project evaluation and interpretation of findings submitted to UMass Amherst faculty and MGH WHA providers. Completed written submission of Capstone Scholarly Project submitted for approval and degree completion; presented to professional audience on UMass Amherst campus.

The complete timeline for the implementation of this project from start to finish was September 1, 2012 through May 2013. Benefits of the timeline included its utility as a communication tool for conveying responsibilities and deadlines, as well as keeping activities coordinated and within sequence and allowing for communication of accountability for assigned

actions to complete, while helping to estimate personnel and material costs (Issel, 2004). It also served as a guide and frame of reference for the DNP(c) in successfully completing all time-sensitive requirements to be considered for eligibility and granting of the clinical practice doctorate in nursing.

Results

Data Collection

A mixed method approach was used in the evaluation of this performance improvement project focusing on impact evaluation in order to permit parallel mixed analysis. This mixed method approach allowed for the concurrent analysis of both quantitative and qualitative data. When utilizing mixed methods in data analysis, investigators purposely integrate or combine the quantitative and qualitative data rather than separating them, with the intention being that such integration leads to maximizing the strengths of the quantitative and qualitative data and minimizes their weaknesses (Creswell, Klassen, Plano Clark, & Smith, 2011). A mixed methods approach to data analysis involves more than simply collecting qualitative data from interviews, or collecting multiple forms of qualitative evidence (i.e., observations and interviews) or multiple types of quantitative evidence (i.e., surveys responses); it involves the intentional collection of both quantitative and qualitative data and the combination of the strengths of each to incorporate into data analysis of a performance improvement project focused on examining standards of care (Creswell, Klassen, Plano Clark, & Smith, 2011).

Quantitative Data: Descriptive Analysis

Initial evaluation of results included analysis of the percentage impact of this program intervention based on the defined goals and outcomes. Three primary objectives of this impact evaluation design performance improvement project were evaluated: successful recruitment for

project participation; provider demonstration of increased knowledge of cervical cancer screening based on responses to clinical vignette-based surveys; and participating provider report of finding the educational programmatic intervention supplied during the project useful in improving standards of care. Of the 17 participating providers employed at the practice setting chosen for the implementation of this project, 9 providers (n=9) were successfully recruited for this project (53% participation). These results, represented below in Figure 2, did not meet the DNP(c)'s projected outcome expectation of a 75% recruitment and participation rate for this research translation project.

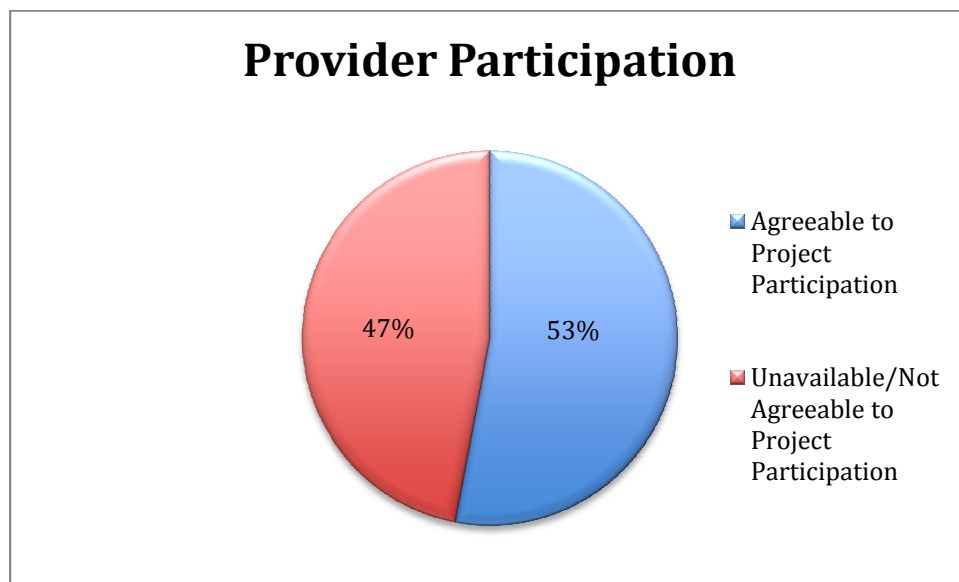


Figure 2. Pie graph representation depicts provider participation in research translation project.

Quantitative data analysis for this project consisted of calculating the percentage of correct answers from each pre- and post-test in an effort to evaluate understanding of cervical cancer screening guidelines based on the educational intervention included in the project. Individual and group mean scores were calculated and compared both within and between conditions (i.e., pre- and post-testing). Prior to the educational intervention's implementation with participants, each sampled provider was asked to independently complete the pre-test

clinical vignette-based survey, which included a total of 3 questions pertaining to timing of screening intervals. Following the implementation of the programmatic intervention of discussing and reviewing the educational handouts with participants along with one-on-one interviewing of each participant by the project investigator, providers completed a post-test survey. While the outcome expectation pertaining to recruitment rate fell short, pre- and post-test results demonstrated 100% accuracy of participating providers (9 out of 9 providers) who routinely screen women ages 21-64 for cervical cancer demonstrated having mastered current best practices of cervical cancer screening recommendations based on responses to the clinical vignette-based survey. Figures 3 and 4 below depict pre- and post-test results.

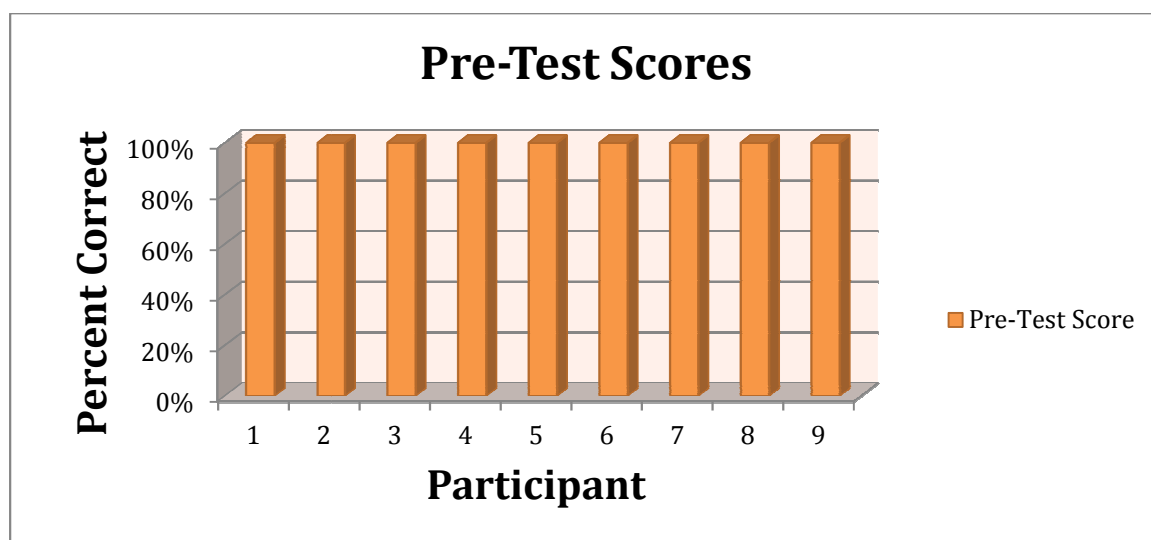


Figure 3. Pre-test scores show provider's understanding of guidelines prior to educational intervention.

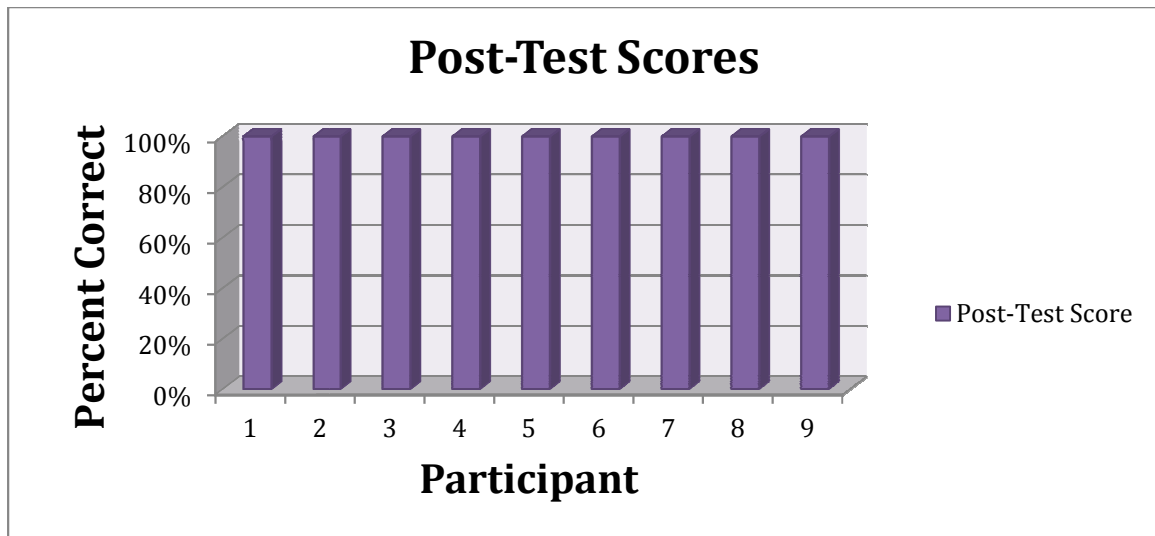


Figure 4. Post-test scores show sustained knowledge of guidelines with educational intervention.

Group means of both pre- and post-test outcomes were compared to evaluate whether the intervention positively influenced and helped to reaffirm clinician's knowledge of cervical cancer screening guideline recommendations. As can be visualized in Figures 3 and 4, there were no changes found in provider knowledge following the educational intervention, as the provider's awareness of guidelines was mastery at baseline. However, 100% of participating providers (9 out of 9 providers) responding to the clinical vignette-based surveys and one-on-one interviews reported finding use of the educational programmatic intervention supplied during the impact program helpful in the direct care of their patients, far exceeding the DNP(c)'s initial outcome expectation of 60%. Figure 5 depicts the percentage analysis of participants reporting clinical practice guidelines usefulness.

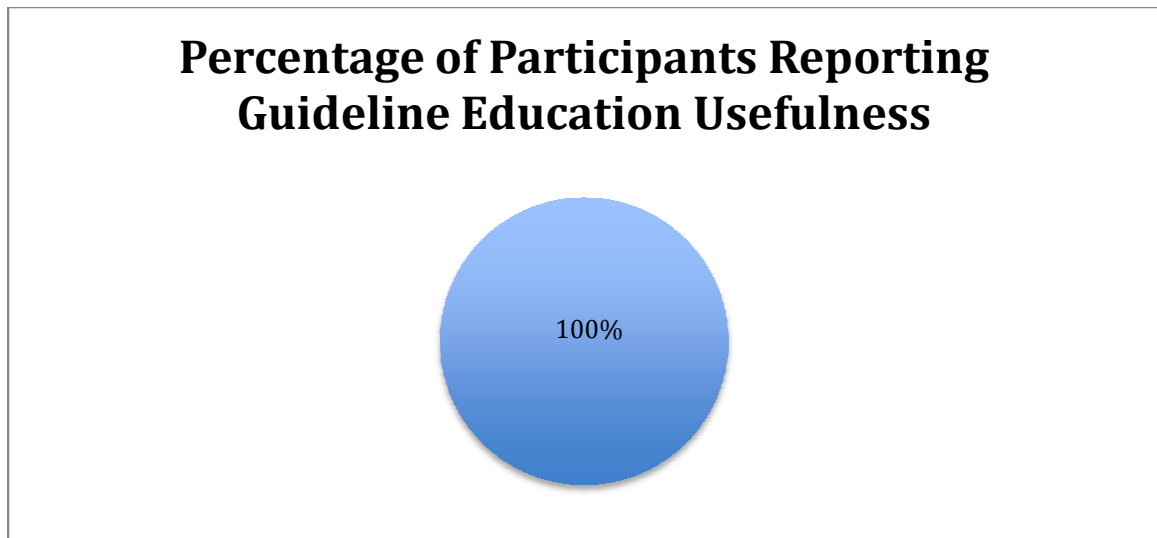


Figure 5. Percentage of participants reporting guideline education usefulness.

This pre-test/post-test design was used to evaluate the educational programmatic intervention and the effectiveness of its review based on providers' use of the recommendations in practice. The impact evaluation design involved collecting data from program participants once at any time before and once at any time after they have received the program (Issel, 2004). A single group was pre-tested, subjected to an action, and then tested again to monitor for knowledge use and sustainment. The success of the project was ultimately determined by comparing pre-test and post-test data. Exclusively, the DNP candidate was interested in understanding how exposing the participants to up-to-date, most current education summarizing the recommendations in the cervical cancer screening guidelines and reviewing with them the specifics within the guidelines, would impact the providers' self-reported actions to use the recommendations within clinical practice.

Qualitative Data: Content Analysis

Qualitative data was collected through the use of journaling, logical analysis, and collection of field notes. Qualitative data was evaluated using content analysis. Content analysis as a qualitative method for planning and evaluation of an implementation project helps to

identify themes of survey questions addressed and their relevance to health program planning and evaluation, as thoughts and perspectives may be revealed in responses and dialogue from participants (Issel, 2004). Generation of inferences from communication during one-on-one meetings with participants aided in identifying shared beliefs of providers regarding the essentiality of effective cervical cancer screening guideline use within the primary care setting.

Through logic analysis and review of field notes post project implementation and one-on-one discussions with participants, it became apparent to the project investigator that while outcome results were consistent across all participants and conditions, there remains a strong possibility that outcomes were impacted by the specialty practice setting in which this project was implemented. Because all providers employed at the practice site who participated in the project hold some degree of specialty practice interest or certification in women's health, it can be accurately assumed that these providers are well versed and educated on most current and updated evidence based research pertaining to the adult female population at their baseline.

Responses related to participant perception of their level of understanding of cervical cancer guideline recommendations were similarly positive, but most providers admitted that they sometimes need to review the guidelines often to stay current. One provider stated, "we have excellent access to the updates because of our easy-to-use guidelines on the computer, and because we're a women's health practice"; with another provider noting, "it will really help to have the guidelines as a handout like you provided to quickly refer back to for my own use or if patients ask about them." The providers also explained that having the printed guidelines readily available is very helpful not only as quick reference, but when dealing with increased workflow or patient assignments. From these statements and reflections, it can be inferred that providers benefit from having access to multiple guideline resources in their practice environment to

enhance their awareness of and adherence to current cervical cytology screening recommendations.

When asked about the how participants were impacted on a regular basis by frequent practice guideline changes and updates, many expressed frustration and exasperation regarding the difficulty in keeping informed of guidelines and screening endorsements. Participants were quoted as saying, “it’s so hard to keep track of cervical cancer screening guidelines and changes”, as well as, “sometimes I confuse the old and new guidelines and mix them up if I don’t review the newest recommendations first.” Anecdotal evidence as referenced suggests that providers recognize and appreciate firsthand the challenges they face with remaining informed of screening recommendations endorsed by various expert organizations. To this end, another participant highlighted how, “it’s a tough period, the 6 months or so after a guideline changes, because everyone is doing a different thing with screening; that’s why having them on hand is so helpful as reference.”

Participating providers were also instrumental in identifying possible sample biases based on the professional population that participated in this research translation project. While quantitative results and descriptive analyses are encouraging, the professional setting is in fact a specialty practice, and results could be skewed given that those participating are perhaps more likely than other general or family practitioners to be current on cervical cytology screening guidelines. As one participant noted, “this project would be important in a non-women’s health practice where women’s care isn’t the specialty focus.” This statement alone made by one participant is advantageous in helping to recognize ways in which to advance this project post implementation and also speaks to the potential for sustainability of the project.

Additionally, providers highlighted an important themed barrier to implementing current

guideline screening practices: the individual patient. Most, if not all, participants independently recognized the individual patient as a potential barrier to adherence to newer cervical cancer screening practices, reporting that, “I have a really hard time getting women on board with these new changes calling for less frequent screening; they’re so used to annual screening.” Another added, “I find that patients have a mix of understanding, so it is important to get the guidelines out there to the public- it’s an important public service campaign to patients.” The necessity for a Pap smear or HPV test should not determine the need for health care or patients seeking out medical attention. With this, some project participants endorsed having a fear of losing patients in continued and annual comprehensive care that may not include cervical cancer prevention, citing that they “worry about losing patients who won’t come back for other aspects of routine health care.” Overall, qualitative results and data analysis were positive and significant to the evaluation of the project, and the logical inferences made helped to drive recommendations and implications for post-project continuation.

Discussion

This research translation project focused on identifying systems to improve provider adherence to and understanding of frequently revised cervical cancer screening guidelines and simultaneously examined how best to implement these guidelines into practice. Final interpretation and discussion of results was shared with all participants and practice providers, including those who did not participate in the project, following finalization of data analysis. Data gathered through the use of a clinical-vignette based survey tool supported the rationale that implementation of effective screening interventions and methods to improve provider adherence to recommendations are important for effectual, safe, and optimal screening practices. A detailed assessment of the self-report of interval cervical cancer screening practices by providers offers a

discrete facet of multiple larger processes that promote screening safety, reduce of harms associated with over screening and over treatment, improve provider/patient communication, and foster ongoing intensive education. All individual processes are means to closing the research-to-practice gap between existing evidence and the current practice application of cervical cancer screening recommendations.

Strengths

Multiple strengths can be identified following evaluation of data collected and analysis of results. First, among the providers sampled in this women's health specialty setting, there was no variation among providers, nurse practitioner or physician, in the recommendation of accurate interval cervical cancer screenings. Nurse practitioners and physicians were uniform and consistent in their awareness of cervical cancer screening clinical practice guidelines, supporting existing research that nurse practitioners are capable of managing comprehensive patient care requirements, including screening services, in the primary care setting (Robert Wood Johnson Foundation, 2012). Research has found that nurse practitioners exceed physicians on meeting measures related to patient follow up; time spent in consultations; and provision of screening, assessment, and counseling services (Robert Wood Johnson Foundation, 2012). As evidenced by the consistency across all participating providers, the results of this research translation project suggest the same.

An additional strength of the project was its impact evaluation design, which utilized open-ended survey questions versus multiple choice or true/false answer options. Recall of actual knowledge in pre- and post-testing was required by participants versus process of elimination or relying on environmental cues in the clinical setting that could serve as prompts evoking memory of recommended screening practices. Furthermore, through interviewing and qualitative analysis,

it was clear that providers were well-versed on current screening guidelines, and from their discourse and the subsequent interpretation of project findings, identifiable themes emerged. Providers identified patients as a clear barrier to implementing lesser interval screening changes in practice, given the inherent nature perhaps compelling some females to request annual screening, as was recommended per guideline recommendations in years past. The process of designing and implementing this scholarly research translation project shed light on how important it is for patients to be aware of cervical cancer screening updates just as much as providers, so that both parties can continually function as joint and integral parts of the patient's collaborative and comprehensive women's health care. This particular theme will help support future implications for extending translational research initiatives based on this topic.

While the outcome expectation of 75% recruitment rate of project participants was not met, as was the aim of the project investigator, a success of this project was the respondent's buy-in and complete follow through by all participants throughout the duration of the project (100% completion rate of 9 out of 9 providers). While only 53% of providers employed at the practice were available and agreeable to participate in the project, thus not meeting the initial outcome expectation, this is a promising outcome given that all participating providers committed to the project through completion, combined with the fact that busy provider schedule were previously identified in both the literature and by the DNP(c) as a possible structural barrier. A recruitment rate of 53%, with complete follow through by all sampled, is comparable to, if not better than, other quality improvement project fall-off and participation rates, especially when considering that this project did not offer participation incentives.

Limitations

Though this research translation project focused on performance improvement of the defined standard of care in cervical cancer screening was successful, it is not without limitations. As mentioned previously, while both quantitative and qualitative results were encouraging, use of a convenience sample versus a randomized sample more representative of providers across other practice specialties may have reduced possible sample bias and skewed results, thus limiting generalizability. This project could be further improved in regards to design and sustainability if replicated in an alternate practice setting with the same target female population. Possible settings include, but are not limited to: family practice, general practice, urgent care/community health setting, or non-specialty internal medicine practice, all which would potentially employ providers (MDs, NPs, or PAs) trained, licensed, and certified to complete cervical cancer screening per practice recommendations. This may also require further adjustments and modifications of the impact evaluation design of the project, as the providers were not able to demonstrate changes in knowledge of guidelines and screening practices given that they exhibited mastery of the information at baseline in pre-testing. Retention, recall, and application of the education components would perhaps require longer monitoring and evaluation between pre- and post-testing to further its significance.

Clinical vignette surveys based on hypothetical patient scenarios were used to elicit provider recommendations for interval screenings, and while sources like the clinical vignette has been deemed a valid tool for measuring quality of clinical practice (Veloski et al., 2005), these vignettes included broad, open-ended questions, which cannot adequately reflect the diversity or miscellany of women that may present in actual clinical practice. Also, the vignette survey tools used in this project cannot replicate observable or unobservable factors that could potentially impact clinical practice. Providers may overstate patient receipt of cervical cancer

screening and their perceptions of practices adherent to guidelines. Overstatements resultant of self-report may imply that adherence to screening practices are in actuality lower than reported in regards to this translational research project.

Conclusions

This research translation project can serve as groundwork for future investigation into helping expand standards of care as they relate to improving provider adherence to cervical cytology screening practices while emphasizing efforts to close the research-to-practice gaps associated with conceivable barriers to the uptake of such recommendations. This project also provided meaningful evidence and insight into feasible and specific changes that should be considered in effort to increase provider adoption of recommended cervical cancer screening methods. While there is concern that newer recommendations for triennial cervical cytology screenings, which may be lengthened further with HPV cotesting, resulting in less frequent patient visits for other preventive care since cervical cancer screening and annual care management which have been traditionally coupled, providers must reinforce the need for patients to return to practice settings for annual pelvic examinations. As one provider so perceptively noted in interviews, “Pap smears and pelvic exams are not synonymous; both play an important role in women’s health care.”

One realistic next step in post-project continuation is the successful creation and dissemination of a patient education brochure on cervical cancer screening in an effort to help reduce the patient as a barrier to adherence to cervical cancer screening and to prevent unnecessary screening and over treatment. With the creation of such educational patient resources, providers will be able to accomplish the following based on their own use and understanding of current guidelines: participate in ongoing discourse with patients about new

guidelines and screening recommendations, with the ultimate goal being to collaboratively improve patient outcomes; implement increased intervals for cervical cancer screening among eligible patients who are aware of guidelines and in agreement to planned screening; utilize HPV testing appropriately to enhance Pap testing and extend screening intervals; prevent unnecessary testing in patient populations that do not warrant cervical cancer screening; and successfully communicate guideline changes to patients in layperson terms to facilitate patient acceptance and practice adoption. Through such educational interventions planned for patient use, providers can play an integral role in promoting awareness, teaching, and improving educational strategies to facilitate changes and patient ways of thinking in regards to cervical cancer screening in light of recent screening guideline updates recommending longer interval screening. With the writing of this scholarly report, patient educational materials on current and comprehensive cervical cancer screening were in development, and are intended to be disseminated at the chosen practice site where this research translation project was implemented.

After successfully completing requirements of this scholarly research translation project, it became evident to this DNP candidate that the sampled providers were not only advanced in their understanding of and adherence to current cervical cytology screening recommendations, they were well aware of significant barriers existent in current practice and culture which can potentially limit the utilization of ideal screening standards. There was a 100% positive approval rate endorsed by participants reporting their impression of clinical practice guidelines usefulness; while sampled providers were clearly well informed of guidelines, barriers to screening, and harms of over screening, these results should not go discounted or ignored, as it is evident, through the rigorous steps of implementing a research translation project, that education and awareness has a profound effect and impact on adherence of screening and prevention. Providers

in this group trusted that using references and resources, including those in the form of educational handouts, benefits their patients and improves the standard of care that they deliver.

In future practice, this DNP candidate is confident that because of their engagement in such high level scholarly work and critical thinking, they will be successful in enhancing their objectivity and understanding of research translation, as a Capstone project provides the foundation for clinical investigation and sets the stage for a broader, sustained program of exploration in a chosen field of practice (Carlson and Hammersla, 2011). DNP graduates should be prepared to act as catalysts for change and assume primary roles for linking academic research and clinical practice to effect greater patient sensitive outcomes and improvements in standards of care. Sharing individual DNP discoveries such as the processes that unfolded as a result of this project will help shape future nursing practitioner roles in various practice settings, while collectively influencing health care outcomes of patient populations so that optimal standards of care are implicit and executed to the highest extent possible.

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Appendix A: Key Stakeholders Agreement Letter



UNIVERSITY OF MASSACHUSETTS AMHERST
Skinner Hall
651 North Pleasant Street
Amherst, MA 01003-9304

School of Nursing

413-687-2626

Fall, 2012

To Whom It May Concern:

I am the Director of the DNP Program at the University of Massachusetts, Amherst, School of Nursing. I am writing this letter on behalf of Amanda Worcester, your student preceptee. Your student is in the final year of the DNP program, is a DNP Candidate, and is planning to complete the final requirement for the Degree, a Capstone Scholarly Project, in your facility. Your student will be designing, implementing, and evaluating the effect of translating a programmatic intervention into your practice or setting. As these projects are considered performance improvement or program evaluation projects and not research studies, the University does not require Institutional Review Board permission for this student to actualize the project as outlined by the student. I am using this letter as a "Key Stakeholder" commitment letter for the student to use in the Capstone Scholarly Project Proposal. A Graduate faculty member of the School of Nursing will, also, be working directly with your student as Chair of the Capstone Scholarly Project.

Thank you in advance for allowing this student to actualize the Capstone Project in your facility. If you have any questions, please call me at 413-687-2624 or email jdemart@nursing.umass.edu.

Key Stakeholder Signature: Jean E. DeMartinis

Date: 12/07/12

Student Signature: Amanda Worcester

Date: 12/7/12

Sincerely,

Jean E. DeMartinis

Jean E. DeMartinis, PhD, FNP-BC
Associate Professor
Director DNP Program

The University of Massachusetts is an Affirmative Action/Equal Opportunity Institution

Appendix B: Educational Handout Documents

Annals of Internal Medicine**SCREENING FOR CERVICAL CANCER**

CLINICAL SUMMARY OF U.S. PREVENTIVE SERVICES TASK FORCE RECOMMENDATION

Population	Women Age 21 to 65 Years	Women Age 30 to 65 Years	Women Younger Than Age 21 Years	Women Older Than Age 65 Years Who Have Had Adequate Prior Screening and Are Not High Risk	Women After Hysterectomy With Removal of the Cervix With No History of High-Grade Precancer or Cervical Cancer	Women Younger Than Age 30 Years
Recommendation	Screen with cytology (Pap smear) every 3 years Grade: A	Screen with cytology every 3 years or co-testing (cytology/human papillomavirus testing [HPV]) every 5 years Grade: A	Do not screen Grade: D	Do not screen Grade: D	Do not screen Grade: D	Do not screen with HPV testing (alone or with cytology) Grade: D
Risk Assessment	HPV infection is associated with nearly all cases of cervical cancer. Other factors that increase a woman's risk for cervical cancer include HIV infection, a compromised immune system, in utero exposure to diethylstilbestrol, and previous treatment of a high-grade precancerous lesion or cervical cancer.					
Screening Tests and Interval	Screening women age 21 to 65 years every 3 years with cytology provides a reasonable balance between benefits and harms. Screening with cytology more often than every 3 years confers little additional benefit, with large increases in harms. HPV testing combined with cytology (co-testing) every 5 years in women age 30 to 65 years offers a comparable balance of benefits and harms, and is therefore a reasonable alternative for women in this age group who would prefer to extend the screening interval.					
Timing of Screening	Screening women younger than age 21 years, regardless of sexual history, leads to more harms than benefits. Clinicians and patients should base the decision to end screening on whether the patient meets the criteria for adequate prior testing and appropriate follow-up, per established guidelines.					
Interventions	Screening aims to identify high-grade precancerous cervical lesions to prevent development of cervical cancer and early-stage asymptomatic invasive cervical cancer. High-grade lesions may be treated with ablative and excisional therapies, including cryotherapy, laser ablation, loop excision, and cold knife conization. Early-stage cervical cancer may be treated with surgery (hysterectomy) or chemoradiation.					
Balance of Benefits and Harms	The benefits of screening with cytology every 3 years substantially outweigh the harms.	The benefits of screening with co-testing (cytology/HPV testing) every 5 years outweigh the harms.	The harms of screening earlier than age 21 years outweigh the benefits.	The benefits of screening after age 65 years do not outweigh the potential harms.	The harms of screening after hysterectomy outweigh the benefits.	The potential harms of screening with HPV testing (alone or with cytology) outweigh the potential benefits.
Other Relevant USPSTF Recommendations	The USPSTF has made recommendations on screening for breast cancer and ovarian cancer, as well as genetic risk assessment and BRCA mutation testing for breast and ovarian cancer susceptibility. These recommendations are available at http://www.uspreventiveservicestaskforce.org/ .					

For a summary of the evidence systematically reviewed in making these recommendations, the full recommendation statement, and supporting documents, please go to <http://www.uspreventiveservicestaskforce.org/>.

Screening for Cervical Cancer: United States Preventive Services Task Force (USPSTF). (2012). Clinical guideline: Screening for cervical cancer: U.S. Preventive Services Task Force recommendation statement. *Annals of Internal Medicine*, E-424. Retrieved March 30, 2012 from: <http://www.annals.org/content/early/2012/03/14/0003-4819-156-12-201206190-00424.full#F1>.

New Cervical Cancer Screening Guidelines Announced

Did you know that having a Pap test annually is no longer recommended by leading medical organizations? New cervical cancer screening guidelines released separately this March by the United States Preventive Services Task Force (USPSTF) and the American Cancer Society (ACS) recommend against routine yearly testing. Instead, the guidelines recommend testing every three years for women ages 21-65; routine cervical cancer screening for women under 21 and over 65 is no longer recommended. The two groups also introduced the option of a lengthened, five-year screening interval for women ages 30-65 when screened with a combination of Pap testing and human papillomavirus (HPV) testing.

These groups routinely review the current, available scientific evidence about the benefits and harms of cancer screening and other preventive services and release guidelines for clinical practice. The Patient Protection and Affordable Care Act requires that health plans cover all preventive services rated “A” or “B” by the USPSTF, so these recommendations are particularly important.

You can find the complete USPSTF cervical cancer screening recommendation statement below. More resources including the evidence synthesis, decision analysis, clinical summary chart and a consumer fact sheet for patients can be found on the USPSTF website:

<http://www.uspreventiveservicestaskforce.org/uspstf/uspscerv.htm>. To view the ACS recommendation statement, visit <http://www.cancer.org/Cancer/news/News/new-screening-guidelines-for-cervical-cancer>.

USPSTF Current Recommendation for Cervical Cancer Screening¹ Release Date: March 2012

These recommendations apply to women who have a cervix, regardless of sexual history. These recommendations do not apply to women who have received a diagnosis of a high-grade precancerous cervical lesion or cervical cancer, women with in utero exposure to diethylstilbestrol, or women who are immunocompromised (such as those who are HIV positive).

- The USPSTF recommends screening women ages 21 to 65 years with cytology every 3 years or, for women ages 30 to 65 years who want to lengthen the screening interval, screening with a combination of cytology and HPV testing every 5 years. **Grade A**
- The USPSTF recommends against screening for cervical cancer in women younger than age 21 years. **Grade D**
- The USPSTF recommends against screening for cervical cancer in women older than age 65 years who have had adequate prior screening and are not otherwise at high risk for cervical cancer. **Grade D**
- The USPSTF recommends against screening for cervical cancer in women who have had a hysterectomy with removal of the cervix and who do not have a history of CIN 2, CIN 3, or cervical cancer. **Grade D**
- The USPSTF recommends against screening for cervical cancer using HPV testing, alone or in combination with cytology, in women younger than age 30 years. **Grade D**

What do the grades mean?

Grade	Definition
A	The USPSTF recommends the service. There is high certainty that the net benefit is substantial.
B	The USPSTF recommends the service . There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.
C	<i>Note: The following statement is undergoing revision.</i> Clinicians may provide this service to selected patients depending on individual circumstances. However, for most individuals without signs or symptoms there is likely to be only a small benefit from this service.
D	The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.

1. Screening for Cervical Cancer, Topic Page. March 2012. U.S. Preventive Services Task Force.
<http://www.uspreventiveservicestaskforce.org/uspstf/uspscerv.htm>

Appendix C: Answers to Clinical Vignette-Based Surveys

Clinical Vignette 1

A 35 year-old female patient presents to your primary care office for a comprehensive physical exam. Her 3 most recent annual Pap test results have been normal and she denies any new sexual partners during the past 5 years. What cervical cytology screening, if any, would you recommend at this visit?

Answer: According to the most current guidelines by the American College of Obstetricians and Gynecologists (ACOG) and the USPSTF, appropriate responses for the first vignette include a Pap test every 3 years*.

Clinical Vignette 2

A 35 year-old female patient presents to your primary care office for a comprehensive physical exam. Within the past 5 years, she has had 1 normal Pap test result and denies any new sexual partners. What cervical cytology screening, if any, would you recommend at this visit?

Answer: An appropriate response for the second vignette included a Pap test every year (ACOG) or every 3 years (USPSTF)*.

Clinical Vignette 3

A 35 year-old female patient presents to your primary care office for a comprehensive physical exam. She has a negative HPV test result and a normal Pap test result from this year. What cervical cytology screening, if any, would you recommend at this visit?

Answer: Vignette 3 includes a separate response for the next HPV and Pap tests; the composite measure to be considered appropriate includes (1) the next Pap test in 3 years with no HPV test or (2) the next Pap and HPV tests in 5 years.

*Because the USPSTF has consistently recommended that screening intervals be at least every 3 years, a response of every 3 years as a conservative but appropriate USPSTF response for vignettes 1 and 2 will be included as acceptable.

Please note that the above answer information was not included on the final vignette tool provided to participants during this project's implementation phase.